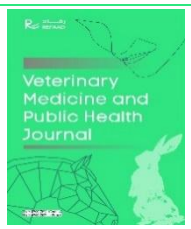
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Geographic distribution of Crimean-Congo Hemorrhagic Fever (CCHF) in Afghanistan

Fazalwali Jalalzai[1*], Nageebullah zafari[2], Zahidullah Ahmadi[3], Shakirullah Niazi[4]

[1] Department of Para-clinic, Faculty of Veterinary Science, Kabul University, Jamal Mina, Kabul, Afghanistan.
[2] Department of Pre-clinic, Faculty of Veterinary Science, Kunduz University, Kunduz, Afghanistan.
[3] Department of Pre-clinic, Faculty of Veterinary Science, Kunduz University, Kunduz, Afghanistan.
[4] Department of Animal Production, Faculty of Veterinary Science, Kabul University, Jamal Mina, Kabul, Afghanistan.
[*] Corresponding Author: Fazalwali Jalalzai (jalalzaifazalwali@gmail.com)

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Abstract:

Objectives: The primary objective of this study is to examine the recorded cases of Crimean–Congo Hemorrhagic Fever (CCHF) reported at the Antani Infectious Diseases Hospital and to analyze the spatial distribution of the disease across different regions of Afghanistan. In addition, the study aims to provide a clearer epidemiological overview by identifying patterns of occurrence and highlighting the public health significance of CCHF in the country.

Methods: A retrospective, descriptive, and analytical study conducted by collecting data from patients who presented to the Antani Hospital and were diagnosed with Crimean–Congo Hemorrhagic Fever after confirmation by PCR testing. These patients were examined to the Kabul Infectious Diseases Hospital (Antani) from 27 March 2025 to 2 September 2025.

Results: Overall, 468 patients were admitted to the CCHF ward of the Antani Hospital. Of these, 350 were male, and 118 were female, a statistically significant difference ($p < 0.001$). The patients had a mean age of 32 years; however, the age difference between males and females was not statistically significant ($p = 0.224$). Among all examined patients, 47 deaths were recorded, resulting in a case fatality rate (CFR) of 10%. The difference in mortality between males and females was not statistically significant ($p = 0.153$). These findings indicate that CCHF is prevalent in almost all parts of Afghanistan.

Conclusion: The incidence of CCHF in Afghanistan is increasing. This study indicates that the mortality rate of CCHF in Afghanistan has decreased compared with previous years.

Keywords: *Hemorrhagic Fever; spatial distribution; endemic; Afghanistan.*

1 Introduction

Crimean–Congo Hemorrhagic Fever (CCHF) is a tick – borne viral zoonotic disease (Frank et al., 2024). This disease is caused by the Crimean–Congo Hemorrhagic Fever virus (CCHFV). The virus belongs to the family Nairoviridae and the genus *Orthonairovirus* (Temur et al., 2021). This disease was first identified in 1944 during World War II in the Crimean Peninsula among Soviet soldiers and was named Crimean hemorrhagic fever; Later, in 1956, the virus was also identified in the Congo, and consequently the disease was named Crimean–Congo Hemorrhagic Fever (CCHF) (Khosti et al., 2023). Crimean–Congo Hemorrhagic Fever (CCHF) is now endemic in many regions of the world, including the Middle East, African countries, and Asian countries, including Afghanistan (Rasikh & Noory, 2023). This disease has a complex life cycle that has not yet been fully characterized. Hard ticks *(Ixodidae*), including species of *Hyalomma*, *Amblyomma*, and *Rhipicephalus*, are involved in its transmission, with *Hyalomma* ticks playing the most significant role (Ilboudo et al., 2025). In addition to hard ticks, some species of soft ticks (*Argasidae*) have also been reported to be involved in the transmission of the disease (Ahmed et al., 2018). Hard ticks play a crucial role as biological vectors in the transmission of this virus. In addition to transmission, ticks also serve as important reservoirs for the causative agent of the disease (Çıtıl et al., 2021). In ticks, the causative agent of this disease is transmitted to the next generation and developmental stages through transovarial and transstadial transmission.

This virus is transmitted to humans through bites of hard ticks and contact with tissues and blood of animals infected with the virus. In rare cases, the disease can also be transmitted from an infected person to a healthy person via body fluids (nosocomial transmission). Persons such as butchers, farmers, livestock handlers, and healthcare workers are at higher risk of infection. In animals, the disease causes an asymptomatic viremia lasting 7–15 days. The main clinical signs in humans include fever, weakness, and hemorrhage (Fanelli et al., 2022). Crimean–Congo Hemorrhagic Fever (CCHF) was first reported in Afghanistan in 1998 in Takhar Province (northern Afghanistan). During this outbreak, approximately 19 cases were recorded, of which 12 patients died (Qaderi et al., 2021; Khosti et al., 2023). Subsequently, another outbreak occurred in 2009 in Herat Province (western Afghanistan). During this outbreak, 60 suspected cases were reported, of which six cases were initially confirmed in Kabul and later confirmed in Egypt (Mustafa et al., 2011). From 2007 to 2018, active surveillance was conducted in 1,284 clinics and laboratories, during which a large number of suspected and confirmed CCHF cases were recorded. The number of CCHF cases in Afghanistan is increasing. According to World Health Organization (WHO) reports, in 2022 Afghanistan was listed as one of the countries with the highest number of reported CCHF cases (Rasikh & Noory, 2023). Most cases of the disease in Afghanistan are reported around Eid al-Adha. During this festival, Muslims sacrifice various animals, including goats, sheep, cows, and camels. These sacrifices take place throughout the country, and butchers and the general public come into contact with the blood and tissues of the animals, leading to an increase in disease cases (Rasikh & Noory, 2023). According to existing reports, Afghanistan is considered one of the high-risk countries for CCHF. The climate of Afghanistan provides a suitable environment for ticks that transmit the CCHF virus, and various species of hard ticks, including *Hyalomma*, have been identified in Afghanistan. Although the number of reported cases is increasing annually across almost all regions of Afghanistan, there are still only a limited number of laboratories and diagnostic centers available for this purpose (Muhammad & Karwand, 2024). This study aimed to evaluate the age, sex, and geographical distribution of Crimean–Congo Hemorrhagic Fever (CCHF) from 27 March to 2 September 2025 at the Infectious Diseases Hospital (Antani) in Kabul. The Antani Hospital is one of the diagnostic hospitals in Afghanistan, where suspected CCHF patients from various provinces are referred for diagnosis and treatment. At this hospital, suspected cases are first brought to the emergency department, and samples from these persons are tested using PCR. After confirmation by PCR, the confirmed cases are admitted to the CCHF ward. The data for this study were collected from the CCHF ward. The general research question is: How were the CCHF cases distributed spatially in Afghanistan, and what is the geographic pattern of the disease based on the data recorded at the Infectious Diseases Hospital clinic using Geographic Information System (GIS).

2 Materials and Methods

2.1 Study Design

This study was a retrospective study and included all patients with Crimean–Congo Hemorrhagic Fever (CCHF) confirmed by PCR, who were admitted to the Antani Hospital in Kabul province (the largest diagnostic and treatment center for infectious diseases in Afghanistan) from 27 March 2025 to 2 September 2025, coming from various provinces of Afghanistan. The aim of this study was to determine the spatial distribution of CCHF across Afghanistan. As this study was retrospective and based on hospital records without personal identifiers, ethical approval was not required. No direct contact or intervention with the patients was conducted, and patient confidentiality was fully maintained. Permission to access the hospital records was also obtained from the hospital authorities.

2.2 Statistical analysis

All continuous and categorical variables were described using mean and standard deviation. To compare the observed proportion of male patients with the expected proportion of 50%, a one-sample binomial test was used. Similarly, the chi-square (χ^2) test was applied to evaluate differences in mortality between males and females. An independent-samples t-test was performed to compare age differences between males and females. All statistical analyses were conducted using SPSS version 25. Additionally, Arc GIS 10.5 was used for mapping and visualizing the spatial distribution of the disease.

3 Results

From 27 March to 2 September 2025, a total of 468 confirmed cases were recorded and admitted at the Antani Hospital in Kabul. Among these, 219 cases (46.79%) were from Kabul Province. In Kabul, the highest number of cases was reported in the city, which comprises 22 districts. Conversely, no positive cases were recorded at the hospital from the districts of Istalif, Farza, Shakardara, Gul Dara, Meshai, and Char Asiab (Figure 2). After Kabul, the provinces with the highest number of reported cases were Parwan (45 cases), Kapisa (25 cases), and Nangarhar (22 cases). The findings of this study indicate that, except for the provinces of Nuristan, Farah, Badghis, and Nimroz, CCHF cases from all other provinces of Afghanistan were reported and referred to the Antani Hospital (Figure 1). Additionally, among all recorded cases, 350 patients (74.8%) were male and 118 (25.2%) were female (Table 1). The results of the one-sample binomial test showed a statistically significant difference in the proportion of males and females ($P < 0.001$), indicating that most patients were male. Out of the 468 patients admitted to the Antani Hospital, 47 patients died (Table 1). The findings of this study indicate that the case fatality rate (CFR) among these patients was 10%, and the results of the chi-square (x^2) test showed no statistically significant difference in mortality between males and females ($P = 0.153$). This study also showed that 130 cases (27.7%) were recorded within 15 days after Eid al-Adha, after which the number of confirmed cases decreased markedly.

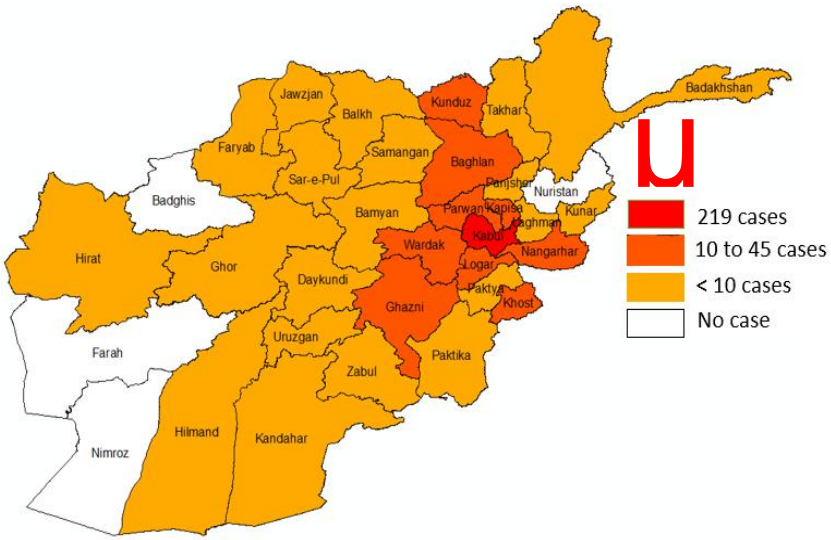


Figure 1: The geographical distribution of CCHF cases in Afghanistan from 27 March 2025 to 2 September 2025; the provinces are divided into four categories: provinces with no cases, less than 10 cases, 10 to 45 cases and 219 cases.

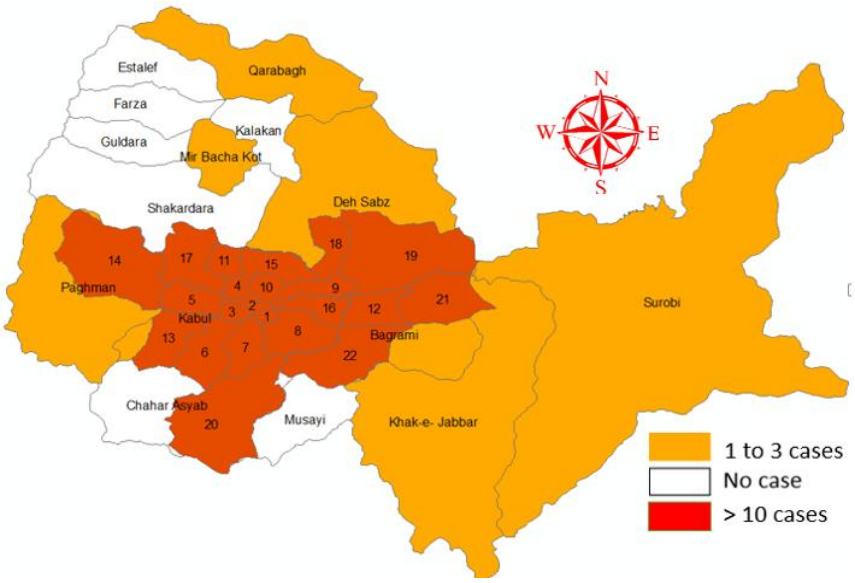


Figure 2: The geographical distribution of CCHF cases in Kabul province from 27 March 2025 to 2 September 2025; the provinces are divided in to three categories: districts with no cases, 1 to 3 cases and more than 10 cases.

Patients' ages ranged from 13 to 85 years, with a mean age of 32 years. The results of the independent-samples t-test showed that the age difference between male and female was not statistically significant (P = 0.224). This age group is generally considered the active and working population in Afghanistan, and persons in this age range are more likely to have contact with animals through various activities (Table 1).

Table 1: This table shows the age, mortality rate, and the ratio of female to male CCHF patients who referred to the infectious disease hospital (Antani) in Kabul.

	Characteristics	Frequency	Percent	Valid Percent
Age groups	13-25 years old	203	43.4%	44.1%
	26-38 years old	123	26.3%	26.7%
	39-51 years old	70	15.0%	15.2%
	52-64 years old	35	7.5%	7.6%
	65-77 years old	26	5.6%	5.7%
	78-90 years old	3	.6%	.7%
	Total	**460**	**98.3%**	**100.0%**
Missing	System	8	1.7%	
	Total	**468**	**100.0%**	
Gender	male	350	74.8%	74.8%
	female	118	25.2%	25.2%
	Total	468	100.0%	100.0%
Outcome	date	47	10.0%	10.0%
	alive	421	90.0%	90.0%
	Total	**468**	**100.0%**	**100.0%**

4 Discussion

Afghanistan is a landlocked country located in an ecological zone suitable for hard ticks (*Ixodidae*), particularly *Hyalomma* ticks, which are the main vectors of CCHF. Reports from the World Health Organization indicate that CCHF cases in Afghanistan are increasing; as reported, the number of confirmed CCHF cases rose from 21 in 2017 to 30 in 2018 (WHO, 2017). In a study conducted by Qaderi and colleagues in Afghanistan between 2017 and 2018, 72.5% of the patients were male. Another study carried out in Turkey reported that 65.7% of the cases were males (Güllü et al., 2025). These findings are similar to our study, as in our research the proportion of male patients with this disease was 74.8%, while females accounted for 25.2%. In a study conducted in Iraq, the proportion of male and female patients was 61% and 39%, respectively (Sabir et al., 2024). This finding is also similar to our study and indicates a higher number of male patients. The higher number of cases among males may be explained by occupational

exposure. In Afghanistan, men are more frequently engaged in livestock keeping, animal trading, slaughtering, and skinning activities, which increase their direct contact with infected animals, blood, and ticks-the primary routes of CCHF transmission. Cultural practices related to animal husbandry and slaughter, particularly during religious and seasonal events, further elevate the risk of infection. A study conducted in Pakistan showed that most CCHF patients belong to the active working population, with the average age of infected persons ranging between 27 and 36 years (Sethi et al., 2024). Another study conducted in Iraq reported that most CCHF patients were between 25 and 44 years old. This study also indicates that the majority of persons affected by CCHF are young and economically active members of society (Kodama et al., 2025). In contrast, the present study shows that the highest proportion of patients (43.4%) were between 13-25 years old (Table1). This difference may be explained by the fact that in Afghanistan many teenager are traditionally involved in livestock rearing and therefore have frequent contact with animals. In general, the case fatality rate (CFR) of Crimean–Congo Hemorrhagic Fever ranges from 5% to 50%, depending on the patient's clinical condition and the availability and quality of healthcare services (Frank et al., 2024; Perveen & Khan, 2022). A study conducted in Turkey reported a case fatality rate (CFR) of 4.7% for Crimean–Congo Hemorrhagic Fever (CCHF) (Şahan, 2025). In contrast, the present study shows that the case fatality rate (CFR) of CCHF is 10% in Afghanistan. The main reasons why the CFR in Turkey is considerably lower than in Afghanistan include public awareness, well-equipped medical facilities, and timely and accurate diagnosis of the disease. Another study conducted in Iraq reported a CCHF fatality rate of 14%, which is similar to the findings of our study (Abdulrahman, 2025). The higher case fatality rate of CCHF in Iraq may be due to low public awareness and insufficient healthcare services. Another study conducted in Iraq reported a CCHF fatality rate of 7.7%, which is nearly consistent with the findings of our study (Al-khafaji et al., 2024) A study conducted in Kazakhstan reported that the case fatality rate (CFR) of CCHF in the country is 4.1% (Rysbekova, 2026). This difference in the case fatality rate may be due to variations in public awareness and the availability of timely and adequate healthcare services. Another study conducted in Afghanistan by Qaderi and colleagues from March 2017 to December 2018 reported a CCHF fatality rate of 21.6%. This difference between the Qaderi study and the present study may be attributed to increased public awareness through scientific seminars held by universities and health centers. Improvements in healthcare services at medical facilities may have also contributed to this difference. A study conducted by Nadir and colleagues in Afghanistan between 2016 and 2018 showed that the incidence of the disease reached its peak during the month of Eid al-Adha (Nadir et al., 2019). Similarly, another study by Qaderi and colleagues reported that approximately 90% of CCHF cases were recorded during the Eid al-Adha period. The findings of Qaderi and Nader are similar to the results of our study. In the present study, 130 cases (27.7%) were recorded within 15 days after Eid al-Adha. This increase can be explained by several epidemiological factors associated with Eid al-Adha. During this period, large numbers of livestock are transported from endemic rural areas to urban markets, facilitating the spread of infected ticks and animals. In addition, many animals are slaughtered by general public without professional training or protective equipment, resulting in direct contact with animal blood and tissues. Participation in religious slaughtering, handling of carcasses, and disposal of animal waste further increase exposure to infectious materials. Consequently, the risk of human infection rises markedly during and immediately after the Eid al-Adha period. The higher number of CCHF cases shortly after Eid al-Adha suggests that animal slaughter and close contact with livestock increase the risk of disease transmission. This highlights the need for targeted interventions, including public awareness, safe slaughter practices, and the use of PPE during this period. Improved surveillance and better healthcare planning around Eid are crucial to reducing morbidity and preventing outbreaks. According to WHO reports, CCHF cases in Afghanistan are increasing. A study conducted by Qaderi and colleagues between 2017 and 2018 showed that CCHF cases were recorded at the Antani Hospital in Kabul from only a few provinces. In this study, most cases were reported from Kabul Province (10–20 cases), while

neighboring provinces of Kabul reported fewer than 10 cases. Additionally, Qaderi and colleagues observed that in some northern provinces of Afghanistan, including Faryab, Jowzjan, Balkh, Samangan, Kunduz, and Takhar, fewer than 10 cases were recorded (Figure 3). The present study also shows that the highest number of CCHF cases was recorded in Kabul Province, with 219 cases (46.79%). Furthermore, the findings indicate that, except for Badghis, Farah, and Nimroz (located in western Afghanistan with relatively arid climates) and Nuristan Province (located in eastern Afghanistan), CCHF cases were reported from all other provinces of Afghanistan (Figure 4). These findings support WHO reports indicating that the incidence of the disease is increasing in Afghanistan. Another possible explanation for the increase in reported CCHF cases at healthcare centers is the improvement in public awareness. In recent years, regular educational seminars and awareness campaigns have been conducted for the general population to inform them about the clinical signs and symptoms of the disease. As a result, people are now more likely to recognize suspected cases early and seek timely medical care. This has led to earlier presentation of patients to hospitals and, consequently, a higher number of recorded cases.

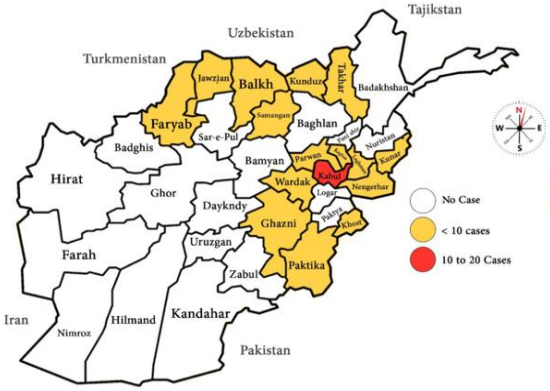


Figure 3: The geographical distribution of CCHF cases from March 2017 to December 2018(Qaderi et al., 2021).

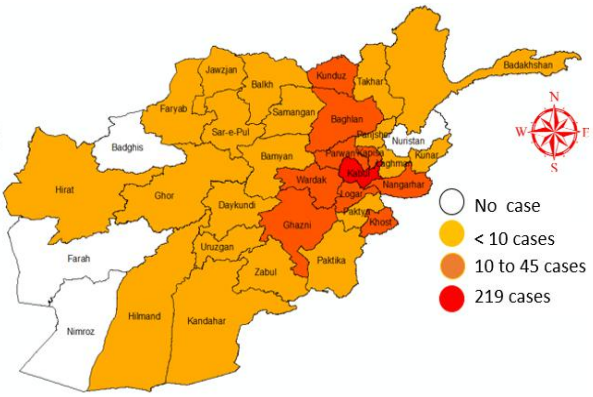


Figure 4: The geographical distribution of CCHF cases from March to September 2025.

5 Conclusions

The results of this study indicate that CCHF is increasing in Afghanistan. During the six-month period of 2025, patients from nearly all provinces of Afghanistan visited the Antani Hospital (except for Badghis, Nimroz, Farah, and Nuristan). The study shows that the highest number of CCHF cases was recorded in Kabul Province. The findings also indicate that most of the affected people were male (74.8%), while females accounted for only 25.2%. The main reason for this is that in Afghan society, men are more frequently engaged in occupations such as livestock farming, animal husbandry, and butchery, and thus have more contact with animals compared to women. Furthermore, the study shows that the majority of cases were reported around Eid al-Adha. In addition, the findings indicate that the case fatality rate of the disease has decreased compared to previous years (10%), mainly due to increased public awareness and timely access to healthcare facilities. The study also reveals that most affected people belong to the active working population, with a mean age of 32 years. In Afghan society, people of this age are typically involved in agriculture and livestock farming and are often in direct or indirect contact with animals.

5.1 Recommendations

Based on the findings of this study, strengthening the hospital-based surveillance system for accurate registration and reporting of CCHF cases is strongly recommended. Increasing awareness among healthcare workers and the general population regarding transmission routes and preventive measures is essential. More rigorous tick control programs. In livestock should be implemented to reduce the risk of transmission. In addition, improving laboratory diagnostic facilities at the provincial level is crucial for early detection and effective management of CCHF cases.

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6 References

Abdulrahman, M. A. (2025). Crimean-Congo hemorrhagic fever, a real health problem in Iraq? *IJID Regions*, 14(January), 100588. [DOI]

Ahmed, A., Tanveer, M., Saqlain, M., & Khan, G. M. (2018). Knowledge, perception and attitude about Crimean Congo Hemorrhagic Fever (CCHF) among medical and pharmacy students of Pakistan. 1–10. [DOI]

Al-khafaji, S. H., Panahi, M. H., Baghdadi, G., Mehrabi, Y., & Hashemi, S. (2024). Epidemiologic Features and Risk Factors for Crimean-Congo Hemorrhagic Fever in Dhi Qar. 16(5). [DOI]

Çıtıl, R., Onder, Y., Duygu, F., Bulut, Y. E., & Çeltek, N. Y. (2021). Determination of Seroprevalence and Risk Factors of Crimean – Congo Haemorrhagic Fever (CCHF) in the Endemic Region in Turkey: A Population-Based Cross-Sectional Study. 2021, 1–10. [DOI]

Fanelli, A., Tizzani, P., & Buonavoglia, D. (2022). Crimean–Congo Haemorrhagic Fever (CCHF) in animals: Global characterization and evolution from 2006 to 2019. *Transboundary and Emerging Diseases*, 69(3), 1556–1567.

Frank, M. G., Weaver, G., Raabe, V., & Working, S. (2024). Crimean-Congo Hemorrhagic Fever Virus for Clinicians — Diagnosis, Clinical Management, and Therapeutics. 30(5). [DOI]

Güllü, D., Yigci, D., Baykam, N., Çelikbas, A. K., Ozden, K., Yapar, D., Inan, R., Güner, R., Do, E., Karakeçili, F., Alay, H., Yüce, Z. T., Eren, E. E., Ozbay, B. O., & Pınarlık, F. (2025). Key predictors of mortality in Crimean-Congo haemorrhagic fever : a retrospective multicentre cohort study. 31, 2056–2062. [DOI]

Ilboudo, A. K., Oloo, S. O., Sircely, J., Nijhof, A. M., & Bett, B. (2025). Spatial analysis and risk mapping of Crimean-Congo hemorrhagic fever (CCHF) in Sub-Saharan Africa. 1–10.

Khosti, A., Sardar, S., & Gulsharif, S. (2023). Crimean-Congo Hemorrhagic Fever (CCHF): An Emerging Disease in Afghanistan. Integrated Journal for Research in Arts and Humanities, 3(1), 34–40. [DOI]

Kodama, C., Alhilfi, R. A., Aakef, I., Khamasi, A., Mahdi, S., Hasan, H. M., Khaleel, R. I., Naji, M. M., Esmaeel, N. K., Haji-jama, S., Legand, A., Keiser, O., Eckerle, I., & Formenty, P. B. H. (2025). Epidemiological analysis and potential factors affecting the 2022 – 23 Crimean-Congo hemorrhagic fever out - break in Iraq. 35, 11–15.

Muhammad, S. D., & Karwand, B. (2024). Descriptive epidemiology and seroprevalence investigations of Crimean-Congo Hemorrhagic Fever virus in domestic animals of northeast Afghanistan. *Animal Advances*, 1(1), 0. [DOI]

Mustafa, M. L., Ayazi, E., Mohareb, E., Yingst, S., Zayed, A., Rossi, C. A., Schoepp, R. J., Mo, J., Fiekert, K., Akhbarian, Z., Sadat, H., & Leslie, T. (2011). Crimean-Congo Hemorrhagic, Afghanistan, 17(10), 3–4.

Nadir, M., Ari, F., & Ataullah, S. (2019). Descriptive epidemiology of Crimean-Congo Hemorrhagic Fever (CCHF) in Afghanistan: Reported cases to National Surveillance System, 2016 – 2018. *International Journal of Infectious Diseases*, 88, 135–140. [DOI]

Perveen, N., & Khan, G. (2022). Crimean – Congo hemorrhagic fever in the Arab world: A systematic review. Frontiers in Veterinary Science, 9. [DOI]

Qaderi, S., Mardani, M., Shah, A., Shah, J., & Bazgir, N. (2021). Crimean-Congo Hemorrhagic Fever (CCHF) in Afghanistan : A retros p ective single center study. *International Journal of Infectious Diseases*, 103, 323–328. [DOI]

Rasikh, A. S., & Noory, A. T. (2023). Clinical and Epidemiological Characteristics of 30 Fatal Cases of Crimean-Congo Hemorrhagic Fever in Kabul, Afghanistan: A Retrospective Observational Study. *Infection and Drug Resistance*, Volume 16, 3469–3476. [DOI]

Rysbekova, A., et al. (2026). Descriptive epidemiology of Crimean-Congo Hemorrhagic Fever Cases in the Southern Region of Kazakhstan in 2023-2024. Research Article, 1–20. [DOI]

Sabir, D. K., Mohammad, S. H., Khwarahm, N. R., Arif, S. K., & Tawfeeq, B. A. (2024). outbreak in Iraq. *IJID One Health*, 2(March), 100017. [DOI]

Şahan,S., Seher,T., Fehminaz,T., Yasemin,C., Erdoğan, Ö., Muhammed, E.D., Ş. B. (2025). Theileriosis in Cattle and Small Ruminants. Journal Homepage: Www.Elsevier.Com/Locate/Ijregi. www.cfsph.iastate.edu

Sethi, S. M., Zahid, S., & Nasir, N. (2024). Predictors of Mortality in Crimean-Congo Hemorrhagic Fever Patients Admitted at a Tertiary Care Hospital in Pakistan over the Last 10 Years : A Case-Control Study. *The American Journal of Tropical Medicine and Hygiene*, 111(2), 416–420.

Temur, A. I., Kuhn, J. H., Pecor, D. B., Apanaskevich, D. A., & Keshtkar-jahromi, M. (2021). Review Article Epidemiology of Crimean-Congo Hemorrhagic Fever (CCHF) in Africa — Underestimated for Decades. 104(6), 1978–1990. [DOI]

WHO. (2017). *Weekly Epidemiological Monitor*. 10(51), 22765273.